

## Container lid

### Description

#### 5 Field of the invention

The invention relates to a thermoformed plastic container lid comprising a substantially sheet like lid body having a depending skirt (1) extending around the full periphery of the lid body, the skirt (1) being suitable for engagement with the peripheral portion of a plastic open top container, comprising a lid rim (2) in a position near the periphery of the lid body, which divides the lid body in a centrally located mirror (3) and an outer part (4) on the other side of the lid rim (2). Such a container lid is also known as a two-step container lid (see figure 1), as opposed to a one-step container lid (see figure 2), in which the rim (2') engages with the container rim.

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#### Background to the invention

A two-step container lid as described in the preamble of claim 1 is known from DE29910076U1. A two-step container lid may be used in situations where the container is covered with a cover foil, whereas the one-step lid may not. The reason is that the mirror of the two-step lid is at the same level as the top rim of the container and the foil. A one-step container lid cannot be used in combination with a foil at the level of the container rim, since the mirror of the one-step lid will be at a level below the level of the foil.

A disadvantage of the known two-step container is that, after initial opening, when the user wants to re-close the container, the top rim of the container may fall  
5 into the recess (8) of the lid rim (2), after which the container cannot be closed. This re-closing problem especially occurs, when the user wants to re-close the container using one hand, and presses the lid on the container from one side to the other.

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It is therefore an object of the invention to avoid the above re-closing problem.

#### **Statement of the invention**

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This object is attained according to the invention in that the lid rim (2) comprises one or more bridges (5) connecting the mirror (3) and the outer part (4).

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The bridge or bridges (5) will cause the lid to slide over the container rim until the container rim is caught by the skirt (1), it is no longer possible that the container rim enters into the recess (8) of the lid rim (2).

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An additional advantage of the invention is that the bridges (5) reduce or even avoid the problem of nesting of the lids when stacked and put under pressure, e.g. in a production line. Conventional two-step lids, may when  
30 stacked and put under pressure nest, because the lid rim (6) of a lower lid may be pushed into the recess (8) of the lid rim (2) of a lid higher in the stack. This

problem is also solved by the provision of bridges (5).  
The tendency to nest is herein determined by measuring  
the pressure needed to compress a stack of lids, and the  
pressure needed is herein called the stack compression  
5 resistance (expressed in N/m<sup>2</sup>).

#### Detailed description of the invention

The container and lid according to the invention may be  
10 made by the technologies known in the art, from  
materials known in the art.

The lid is made by thermoforming. In thermoforming a  
plastic sheet softened by heat is formed either into or  
15 around a mould. This forming step may be supported by  
vacuum, air pressure, and material distribution may be  
improved by plug assistance. There are three main groups  
of thermoforming: vacuum forming, pressure forming and  
matched mould forming.

20 The material of the lid and container may be any  
material known for this use. Examples of possible  
materials are HDPE (high density polyethylene), LDPE  
(Low density polyethylene), PP (polypropylene),  
25 PET (Polyester Terephthalate), PVC (Polyvinylchloride),  
OPVC (oriented PVC) , PC (Polycarbonate), EVOH  
(Ethylenevinylalcohol) and multilayer materials of two  
or more of these polymers.

30 The shape of the container lid may be any shape, for  
example round, rounded rectangular, oval or square.

The skirt (1) is preferably provided with indent features (7) see figure 4. These indent features (7) fix the lid on the container when closed.

- 5 In a preferred embodiment, the one or more bridges (5) are in the same plane as the mirror (3). In another preferred embodiment the lid rim (2) comprises four or more bridges (5). Four bridges (5) may already be effective if positioned on each of the sides of a square  
10 or rectangular container lid. Preferably the container lid comprising six or more bridges (5) and preferably the bridges (5) are distributed evenly around the periphery of the lid.
- 15 Another preferred embodiment of the invention is shown in figure 5, which shows the cross-section of the two preferred lids at the place of a bridge. In this preferred embodiment, the bridge is a partial bridge consisting of two bridge parts (9,10), each bridge part  
20 (9,10) being an indentation of a side wall of the lid rim (2). Preferably, the indentation is formed by placing part of the side wall at a negative angle, compared to the side wall at a place where there is no bridge, as shown in figure 5. The advantage of this  
25 construction is that it is no longer possible that the container rim enters into the recess (8) of the lid rim (2) and that the stack compression resistance is very high, because a load on the stack is effectively transferred to lower lids, through the bridge parts  
30 (9,10).

The number of bridges may be easily determined by the skilled person taking into consideration the size and shape of the container lid. A large container lid will need more bridges than a small container lid.

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In another preferred embodiment the container lid comprises an uneven number of bridges (5) evenly distributed around the periphery of the lid. This improves the flexing strength of the lid, compared to  
10 the same lid with an even number of bridges distributed evenly around the periphery of the lid. Preferably the width of the bridges (5) is 3 mm or more. The width should be such that the bridge does not break when a pressure commonly used to close the container is  
15 applied. The features of the preferred embodiments described above may be applied as such or in combination with each other.

The lid and container may be used for packaging consumer  
20 goods, such as for instance foods, such as for instance margarines or spreads.

#### **Description of the drawings**

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Figure 1: Cross-section of detail of two stacked one-step container lids

Figure 2: Cross-section of detail of two stacked two-step container lids

30 Figure 3: Top view of container lid according to the invention having eight bridges

- Figure 4: Side view of conventional container lid showing skirt (1) and indent features (7), as may also be applied on the lid according to the invention
- 5 Figure 5: Cross-section of detail of a preferred embodiment, showing partial bridges (9,10)